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10/023,199	12/14/2001	Adnan Kavak	SAMS01-00163	2594

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EXAMINER

PHUONG, DAI

ART UNIT PAPER NUMBER

2685

DATE MAILED: 09/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/023,199

Applicant(s)

KAVAK ET AL.

Examiner

Dai A Phuong

Art Unit

2685

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12/14/2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-2 and 11-12 is/are rejected.
- 7) ☒ Claim(s) 3-10 and 13-20 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

**DETAILED ACTION**

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 1-4, 10 and 13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 1-4, 10 and 13, the term "capable of" renders the claim indefinite (not positive).

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claim 1-2 and 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ylitalo et al. (U.S. Patent 6,671,499) in view of Boyle (U.S. Patent 6,725,057).

Regarding claim 1, Ylitalo et al. disclose a wireless network communications system comprising a base transceiver station having an adaptive antenna array 150 (Fig. 4, col. 4, line 23) and a mobile station having an antenna 100 (Fig. 4, col. 4, line 26), an apparatus 202 and 203 (Fig. 4, col. 4, lines 44-49) for improving downlink

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performance of said adaptive antenna array of said base transceiver station, said apparatus comprising:

a spatial signature estimator 201 (Fig. 4, col. 5, lines 1-5) associated with said base transceiver station, said spatial signature estimator capable of obtaining a spatial signature from a signal received (Fig. 3, 211-213) by said base transceiver station from said mobile antenna (col. 3, line 1-27 and col. 5, lines 1-32).

correlation circuitry 202 and 203 (Fig. 4, col. 5, lines 1-37) coupled to said spatial signature estimator 201, said correlation circuitry capable of using spatial signatures (Fig. 3, 211-213) obtained from said mobile antenna to identify a least changing spatial signature, and capable of using said least changing spatial signature to obtain a downlink beamforming weight vector (col. 5, line 1-37 and col. 6, lines 1-10).

But, Ylitalo et al. do not teach a mobile station having a first mobile antenna and a second mobile antenna. However, Boyle teaches that it is common to have a first mobile antenna and a second mobile antenna 102A and 102B (Fig. 2, col. 2, lines 7-9 and lines 37-40), in order to mitigate transmission error. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the mobile station of Ylitalo et al. by specifically having a first mobile antenna and a second antenna, as taught by Boyle et al., to provide two signals, each signal is from each antenna to the base station. The purpose of this is to improve transmission quality in both of a transmitting state and receiving state.

Regarding claim 2, Ylitalo et al. and Boyle disclose all the limitation of

claim 1. Ylitalo et al. disclose wherein said spatial signature estimator 201 is capable of obtaining a first set of spatial signatures (Fig. 3, 211) comprising a first spatial signature from said first mobile antenna and a first spatial signature from said second mobile antenna during a first portion of an uplink interval of a time division duplex (col. 4, lines 19-20) slot associated with said first mobile antenna and said second mobile antenna.

wherein said spatial signature estimator 201 is capable of obtaining a second set of spatial signatures (Fig. 3, 212) comprising a second spatial signature from said first mobile antenna and a second spatial signature from said second mobile antenna during a second portion of said uplink interval (Fig. 3, col. 5, lines 1-65).

wherein said correlation circuitry 202 and 202 is capable of measuring changes in said second set of spatial signatures with respect to said first set of spatial signatures to identify said least changing spatial signature (Fig. 4, col. 5, lines 1-65 ).

Regarding claim 11, Ylitalo et al. disclose a wireless network communications system comprising a base transceiver station having an adaptive antenna array 150 (Fig. 4, col. 4, line 23) and a mobile station having an antenna 100 (Fig. 4, col. 4, line 26), an apparatus 202 and 203 (Fig. 4, col. 4, lines 44-49) for improving downlink performance of said adaptive antenna array of said base transceiver station, said method comprising the steps of:

Obtaining in a spatial signature estimator 201 (Fig. 4, col. 5, lines 1-5) associated with said base transceiver station a spatial signature from a signal received (Fig. 3, 211)

by said base transceiver station from said first mobile antenna (col. 3, line 1-27 and col. 5, lines 1-32).

obtaining in said spatial signature estimator 201 a spatial signature from a signal received (Fig. 3, 212) by said base transceiver station from said second mobile antenna (col. 3, line 1-27 and col. 5, lines 1-32).

using spatial signatures obtained from said first mobile antenna (Fig. 3, 211) and from said second mobile antenna (Fig. 3, 212) to identify a least changing spatial signature (Fig. 4, col. 3, line 1-27 and col. 5, lines 1-32).

using said least changing spatial signature to obtain a downlink beamforming weight vector ( col. 3, line 2-27 and col. 5, lines 1-65 and col. 6, lines 1-18).

But, Ylitalo et al. do not explicitly show a mobile station having a first mobile antenna and a second mobile antenna. However, Boyle teaches that it is common to have a first mobile antenna and a second mobile antenna 102A and 102B (Fig. 2, col. 2, lines 7-9 and lines 37-40), in order to mitigate transmission error. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the mobile station of Ylitalo et al. by specifically having a first mobile antenna and a second antenna, as taught by Boyle et al., to provide two signals, each signal is from each antenna to the base station. The purpose of this is to improve transmission quality in both of a transmitting state and receiving state.

Regarding claim 12, Ylitalo et al. and Boyle disclose all the limitation of claim 11. In addition, Ylitalo et al. disclose the method:

obtaining in said spatial signature estimator 201 a first set of spatial signatures (Fig. 3, 211) comprising a first spatial signature from said first mobile antenna and a first spatial signature from said second mobile antenna during a first portion of an uplink interval of a time division duplex (col. 4, lines 19-20) slot associated with said first mobile antenna and said second mobile antenna (Fig. 3, col. 5, lines 1-65).

obtaining in said spatial signature estimator 201 a second set of spatial signatures (Fig. 3, 212) comprising a second spatial signature from said first mobile antenna and a second spatial signature from said second mobile antenna during a second portion of said uplink interval (Fig 3, col. 5, lines 1-65).

using correlation circuitry 202 and 203 is capable of measuring changes in said second set of spatial signatures with respect to said first set of spatial signatures to identify said least changing spatial signature (Fig. 4, col. 5, lines 1-65 ).

### ***Allowable Subject Matter***

3. Claims 3-10 and 13-20 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

The following is a statement of reason for the indication of allowance: the prior art made of record and considered pertinent to the applicant's disclosure does not disclose nor fairly suggest the method of: a first spatial correlator coupled to said controller and to said table, said first spatial correlator capable of correlating values of spatial signatures from said first mobile antenna; a second spatial correlator coupled to said

controller and to said table, said second spatial correlator capable of correlating values of spatial signatures from said second mobile antenna; a comparator coupled to said controller and to said first spatial correlator and to said second spatial correlator, said comparator capable of comparing correlation values from said first spatial correlator and from said second spatial correlator to determine a downlink beamforming weight vector.

Claims 4-10 are allowed as being depended on independent claim 3.

Claims 14-20 are allowed as being depended on independent claim 13.

### ***Conclusion***

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Boros et al. (U.S. Patent 6,615,024) disclose method for calibrating communication.

Petrus et al. (Pub. No. : U.S. 200/0090978) disclose a method for estimating downlink communication.

Walton et al. (Pub. No. : U.S. 2003/0087673) disclose a method for allocating downlink resource.

Walton et al. (Pub. No. : U.S. 2003/0064754) disclose a method for clustering communication targets

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dai A Phuong whose telephone number is 703-605-

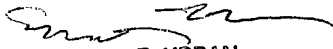


4373. The examiner can normally be reached on Monday to Friday, 9:00 A.M. to 5:00 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Urban can be reached on 703-305-4385. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Phuong Dai  
AU: 2685  
Date : 09-07-2004

  
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